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Mental health of children exposed to intimate partner violence against their mother: a longitudinal study from Brazil

Abstract

Background: Exposure to intimate partner violence (IPV) is an important adverse childhood experience, but there are few longitudinal studies in low and middle-income countries.

Objective: To investigate the consequences of exposure to IPV for the child's mental health.

Participants and Setting: 614 mother-child pairs were evaluated in a poor urban district in Recife, northeastern Brazil.

Methods: A prospective cohort study enrolled pregnant women in 2005-2006. Women were interviewed in pregnancy, postpartum and six to nine years after delivery, and asked about their experience of IPV, and the exposure of their child to violence. The Strengths and Difficulties Questionnaire (SDQ) was completed by child's mother and teacher. Ten types of child experience of IPV and the age of onset of exposure were compared with the child's behavioral profile at school age.

Results: The commonest types of child exposure to IPV were "prenatally", "overheard" "eyewitnessed"; 10.0% of children were physically or verbally involved in the IPV. Mothers reported high SDQ Total Difficulties scores in 71.7% of all children exposed to IPV and teachers in 59.8%. Multivariate analyses demonstrated associations between exposures to IPV with SDQ scores. The strongest association with behavioral difficulties was with exposure in the age group 1-2 years (OR 2.5 [95% CI: 1.3-4.8]).

Conclusions: Young children are sensitive to the age of first exposure to IPV and to the type of IPV. Interventions to reduce IPV should be targeted on vulnerable women from poor urban communities during their pregnancies and in the first two years of their child's life.

Key words: Interpersonal violence, Intimate partner violence, Domestic violence, Pregnancy, Child behavior, Low and middle-income country

1. Introduction

Intimate partner violence (IPV) has a high prevalence all over the world, but especially in poor communities (Han & Stewart, 2014). Exposure to IPV is an important adverse childhood experience (ACE) which can lead to health, social, and psychological problems (Jimenez, Wade, Lin, Morrow, & Reichman, 2016) throughout the life course (Halfon, Larson, Lu, Tullis, & Russ, 2014). Behavioral, emotional, cognitive, social, and physical problems (Howell, Barnes, Miller, & Graham-Bermann, 2016; Bowen, 2015) may persist into adulthood, including the possibility of the victim becoming an aggressor, leading to the transgenerational transmission of violence (Widom, Czaja, & Dutton, 2014). The negative consequences of children's exposure to violence committed against their mothers by their intimate partner have been reported even if the child is not a direct target of violence (McFarlane, Symes, Binder, Maddoux, & Paulson, 2014). The physical and mental health impacts of such violence have resulted in growing concern regarding the exposure of children to IPV (National Scientific Council on the Developing Child, 2012). There are few longitudinal studies of impact of IPV in childhood. To measure impact, cohort studies starting in pregnancy are required. We report the first such study in Brazil

A systematic review and metanalysis (Silva, Lemos, Andrade, & Ludermir, 2018) of evidence from cohort studies and case-control studies published before July 2017 identified only seven studies, six from high income countries and one from China, an upper middle income country. Analysis of the pooled data demonstrated effect sizes of around two for prenatal exposure to IPV on both internalizing and externalizing behaviors later in childhood. The metanalysis highlighted the need for prospective follow-up studies of exposure to IPV from low and middle income countries (LMICs) starting in pregnancy with behavioral outcomes in childhood (Silva, Lemos, Andrade, & Ludermir, 2018).

The objectives of this prospective study undertaken in a poor urban district in northeastern Brazil were to measure the consequences of exposure to IPV for the child's psychosocial development, and to evaluate associations with the types of exposure to IPV and the age at which the child was first exposed. We hypothesized that behavioral difficulties at school age would be related to the type of violence experienced and the age of first exposure to IPV.

2. Methods

2.1. Study design and population

A prospective cohort study enrolled women and children in a poor urban district in northeastern Brazil. Eligible participants were pregnant women registered in 2005-2006 at the primary health-care clinics of health district II in the city of Recife, Pernambuco. Initial interviews were conducted from July 2005 to October 2006 with 1120 pregnant women aged between 18 and 49 years old, from their 31st week of gestation. In this initial sample 862 women were aged ≥ 21 years (76.9%), 897 who declared themselves of non-white race / skin colour (80.1%); 777 had less than nine years of schooling (69.4%), and 422 had no house of their own (37.6%). In the second stage, interviews were conducted from May to December 2006 with 1057 women up to one year postpartum.

In a third stage, conducted from July 2013 to December 2014, 644 mothers were re-interviewed (61.0%), when the children were of school age (six to nine years). 413 women (39.0%) had changed their address and were not found. Five mothers of twins, four mothers of children who died, two who gave their children away and two whose children lived with another family member were excluded, as well as seven children whose mothers did not allow them to be evaluated by the teacher, three children who were out of school and seven who were living in other municipalities of Pernambuco or other states.

The final sample for analysis was 614 pairs of mothers and their children, representing 58.0% of the women who participated in the second stage. This final sample consisted of 456 (74.3%) women ≥ 30 years old, 409 (66.6%) with low income and 501 (81.6%) who declared themselves to be of non-white ethnicity. Non-white participants were predominately mixed race (brown/pardo), with no participants of black African or Asian origin. The children were between 6 and 9 years old with almost equal numbers of boys and girls. The majority (n=488, 79.5%) were attending second grade of elementary school

2.2. Procedures

In the first stage pregnant women were identified from the records of Community Health Agents and informed written consent was obtained during a routine prenatal consultation. The initial interview was conducted in a reserved room at the Family Health Unit (FHU), or at home for those high-risk pregnant women who did not attend prenatal care at the FHU.

In the second stage, after delivery, the women were contacted from the scheduling for the childcare consultations. Contact was made at home for women who had not scheduled consultation for childcare, and the interview was held at a date and place that was most convenient for them. Most of the interviews were done at home because of the inconvenience of interviewing the mothers with the baby in FHU.

In the third stage the women from the second stage responded to the same questions on their socioeconomic and demographic situation, social support, mental health, and experience of violence. They answered a child questionnaire about exposure of the child from the original pregnancy to situations of violence, and completed the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997). With mothers' written consent, a total of 162 schools (95 private and 67 public) were visited by a researcher, and the child's teacher completed the SDQ about the index child.

From the first to the second stage of the study there was a loss of only 5.7%, and from the second to the third stage there was a loss of 39%. However, there were no statistical differences in age, ethnicity, marital status, schooling and IPV reports between women who were part of the third stage of the study and those who were not (Silva, Lima, & Ludermit, 2017).

All interviews were conducted at a venue of the mother's choosing by trained female researchers, without the mother's partner or any child aged two or over being present. The women interviewed received a brochure with information on the support services available in the city of Recife for women and children who are victims of violence.

The research was approved by the Research Ethics Committee of the Health Sciences Center of the Federal University of Pernambuco (ref 194672: 06/02/2013).

2.3. Measures

2.3.1. Intimate Partner Violence

An intimate partner was defined as the sexual partner or former partner with whom the woman was living or had lived, regardless of formal union and cohabitation.

The instrument used to measure IPV was based on the core questions previously used in the WHO Multicountry study on Womens Health and Domestic Violence, of which two regions of Brazil - São Paulo and Zona da Mata de Pernambuco - formed part (Garcia-Moreno, et al., 2006; Schraiber et al., 2007). The questionnaire contains six questions on physical violence, four on psychological and three on sexual violence. Physical violence was defined as physical assault or the use of objects or weapons to produce injuries. Psychological violence was characterized as threatening behavior, humiliation and insults; and sexual violence as sexual relations through physical coercion or threats and the imposition of actions considered humiliating. In previous studies in Brazil (in São Luiz and Ribeirão Preto) the instrument had a high internal consistency (Chronbach's α .88 and .89), when used with non-pregnant women

(Schraiber, Latorre, França Jr, Segri, & D'Oliveira, 2010). With pregnant women, Chronbach's α was .76 and .82, (Ribeiro et al., 2014). Any woman who answered "yes" to at least one of the questions that characterized each type of violence was considered as a victim of IPV.

2.3.2. Children's Exposure to Intimate Partner Violence

The mother was the informant about the child's exposure to intimate partner violence (CEIPV), and responded to questions about the age of first exposure and the type of IPV. CEIPV was defined following Holden's classification (Holden, 2003), which describes six types of direct exposure (exposed prenatally, overhears, eyewitness, intervenes, participates and victimized) and four of indirect exposure (observes the initial effects, experiences the aftermath, hears about it and ostensibly unaware). The questionnaire about the CEIPV has good internal consistency (Cronbach's $\alpha = .81$).

The age of onset of CEIPV was analyzed in five categories: "No Exposure," "Exposure in the prenatal period," "0-11 months," "1-2 years" and " ≥ 3 years".

2.3.3. Behavioral and Emotional Difficulties

The Strengths and Difficulties Questionnaire is a short questionnaire developed by Goodman (1997) which is widely used to identify behavioral and emotional difficulties in children and adolescents aged 4-17 years. It consists of 25 attributes, some positive and others negative, divided into five scales, each containing five items, which generate a total difficulty score and scores for prosocial behavior, hyperactivity/inattention, emotional problems, behavioral problems and relationship problems with peers. For this study, the validated version for Brazil was used ([http://www.sdqinfo.org/py/sdqinfo/b3.py?language=Portugueseqz\(Brazil\)](http://www.sdqinfo.org/py/sdqinfo/b3.py?language=Portugueseqz(Brazil))) and the cut-off points 0-13 points were used to categorize normal children, 14-16 for borderline and 17-40 for abnormal. Goodman (1997) defined the abnormal cut-off as the worse 10% based on

a population-based UK survey, We used the Total Difficulties score of the SDQ. A child with a score of 17 or over was considered to have high risk of mental health problems (Goodman, 1997). ‘Borderline’ was categorized with ‘normal’, which was then compared with ‘abnormal’. Although SDQ scores can be used as continuous variables, Goodman & Goodman (2011) reported that it is sometimes convenient to categorize scores, because research findings as proportions may be more easily interpreted by policymakers and service providers. Several studies have presented categorized SDQ scores (Chander et al., 2017; Johnson et al., 2014; Boman et al., 2016).

In the present study the internal consistency was Cronbach’s $\alpha = .77$ for the mother completed SDQ and .88 for the teacher completed SDQ, and the agreement between mothers’ SDQ and teachers’ SDQ was 66.5%.

2.3.4. Covariates

In the initial analyses we included the following covariates related to socio-demographic characteristics of the mother: age (<30 years *vs* ≥ 30 years), education (≤ 9 *vs* > 9 years of schooling), marital status (with *vs* without partner), current partner is the father of the child (yes *vs* no), income, house ownership (yes *vs* no), head of household (yes *vs* no). To assess ethnicity, the women were invited to self-reference as one of five skin colours (white, black, mulatto/brown, yellow, or indigenous) that are used in the classification adopted by the Brazilian census (Instituto Brasileiro de Geografia e Estatística - IBGE, 2010), and were grouped as white *vs* non-white. Employment status was categorized according to the classification adopted by the Brazilian census (IBGE, 2010): formal worker, informal worker, housewife, unemployed, student, or retired. In this report, we have grouped women as unemployed *vs* employment.

The mother's lifestyle variables analyzed were: smoking (yes vs no), use of alcohol (yes vs no), drug use (yes vs no). The partner lifestyle variables were: smoking (yes vs no), abusive use of alcohol (yes vs no), drug use (yes vs no), and involvement in fights outside the home (yes vs no).

The profile of the couple's relationship was measured by use of the variables: duration of the couple's relationship (<6 years vs ≥ 6 years), fights (<1 time vs ≥ 1 time per month), woman's physical aggression against her partner without being attacked (yes vs no), women's infidelity (yes vs no), partner's infidelity (yes vs no).

The child variables were: age (6-7 years vs 8-9 years), sex (female vs male), number of siblings (None, 1-2, and 3 or more), position in the family (1st or 2nd born vs third born), school grade (secondary vs primary school), type of school (private vs public).

2.4. Statistical analysis

Statistical analysis was performed using Stata 13.0 for Windows. The frequency of the types of IPV and the age of first exposure of the child to IPV, reported by the mother (independent variables), and the behavioral problems of the children (the outcome variable) were estimated. Potential confounders were chosen on the basis of published reports of possible risk factors for the occurrence of IPV (Capaldi, Knoble, Shortt, & Kim, 2012; Fleming et al., 2015) and problems in the mental health of children (Boman et al., 2016). A bivariate analysis of the covariates with types of CEIPV and behavioral problems of the children were performed. Variables that had p value <0.20 were considered for inclusion in the multivariate logistic regression analysis of each of the ten types of exposure and age of onset of CEIPV. Variables with missing data (eg partner's infidelity) were not included in the multivariate logistic regression analysis. Results are reported as Odds Ratios (OR) with 95% confidence intervals (CI).

3. Results

3.1 mental health difficulties of child

A summary of the results of both the mother and teacher completed SDQ can be found in Table 1. The mothers reported that 71.7% of the CEIPV group had a total difficulties score above the cut off, while the teachers' scores were generally lower, with 59.8% of CEIPV having an abnormal total difficulties score, compared with non-exposed. No gender differences were apparent. Conduct problems and emotional symptoms were the most frequent difficulties identified by the mothers. Teachers identified hyperactivity and peer relationship problems most commonly, and the only scale they reported more difficulties than the mothers was in peer relationship problems. Because the teachers did not identify any overall differences between the CEIPV group and those not exposed, further analyses were undertaken only using the mothers' SDQ data

Insert table 1

Table 2 shows the associations of the child's abnormal total difficulties score with the family's socio-demographic characteristics, the lifestyle of the woman and the partner, the relationship of the couple, and the child's characteristics. The risk of a child presenting behavioral problems at school age was higher for those mothers with less than nine years of schooling, who were unemployed, with an income less than one minimum wage, and for those women whose partners used drugs and were engaged in fights outside the home. The couples that had fights more frequently were also more likely to have a child with behavior problems. Children with high total difficulties scores were more likely to have three or more siblings, to occupy the third or greater position in the family and to have attended a public rather than a private school.

Insert Table 2

3.2 IPV reported by the mother

Figure 1 shows the different types of IPV reported in this study. Among the 614 women interviewed at all three stages of the cohort study, 319 (52.0%) reported that some type of violence (psychological, physical or sexual) had occurred at some time (during pregnancy, in the postpartum, and the last six to nine years of the child's life). Violence during pregnancy was reported by 171 women (28.0%); in the postpartum period by 135 (88+47) women (22.0%), and during the last seven years by 200 (48+34+17+101) women (32.5%). The incidence of IPV in the postpartum period was 7.7% (95% CI: 5.7%-9.9%) and during the first six to nine years of the child's life, it was 16.4% (95% CI: 13.7%-19.5%). The main perpetrator was the child's father, responsible for 69.9% of IPV.

Insert Figure 1

The mothers considered that 372 (60.6%) children had been exposed to IPV. The commonest types of direct exposure were "exposed prenatally" (28.0%), "overheard" (32.7%) and "eyewitnessed" (27.9%). Mothers reported that 10% of children were physically or verbally involved in the IPV, and that 12% of children tried to intervene to stop the violent acts. Children were also indirectly exposed, living with the "consequences for the mother's mental health" (33.1%) and "experiences the immediate aftermath" (19.0%).

3.3 relationship between IPV exposure and mental health difficulties

In the multivariable logistic regression (Table 3), after adjustment for socioeconomic characteristics of the woman, lifestyle characteristics of the partner and the mother, relationship profile, and socio-demographic characteristics of the child most types of exposure were associated with behavioral problems of the child, except for "prenatal exposure", "intervened", and "experiences the aftermath".

Insert Table 3

Table 4 shows the analyses by age of first exposure to IPV. Although most first exposure was in pregnancy, and any exposure to IPV during pregnancy until two years of age was associated with behavior problems at school age, the strongest association was with initial exposure in the age group 1-2 years (OR 2.5 [95% CI: 1.3-4.8]). The relationship between behavior problems and first exposure to IPV persisted after adjustment for socioeconomic characteristics of the woman, lifestyle characteristics of the partner, relationship profile and socio-demographic characteristics of the child in all age groups with the exception of the age group ≥ 3 years.

Insert Table 4

4. Discussion

This longitudinal study from a poor urban sample in a low middle income country has demonstrated that over half of all women experienced IPV, and at least 60% of their children were exposed to their mother's IPV in utero and during the first six to nine years of life. As hypothesized, school-age behavior problems as reported by the mother were persistently associated with the age of the child at first exposure to IPV and with the type of exposure to violence suffered by the mother. The most vulnerable age group for subsequent behavioral problems was children first exposed to IPV before two years of age, i.e. in the first 1000 days of life. Both direct and indirect exposures to IPV had an effect on subsequent behavioral profile; the strongest associations were with "participating" in IPV and "hears about it" experienced by the mother.

One of the most striking findings in this study is the differences in the mothers' and teachers' reports on the same children using the same scale - the SDQ. The teachers reported fewer behavioral difficulties, and a similar frequency of difficulties in those children exposed and those not exposed to IPV. There was only a weak agreement between the mothers' and

teachers' scores: this may reflect over-reporting by mothers who are sensitized to their child's behavior and don't have peers to compare with, or under-reporting by teachers working in very difficult school settings with large classes of >30 pupils who only remember the more extreme externalizing behaviors. These differences between mothers' and teachers' SDQ results on the same children have been noted in other studies (Boman et al., 2016; Johnson, Hollis, Marlow, Simms, & Wolke, 2014).

The high frequency of IPV and the CEIPV reported by the women in this study is consistent with the international literature from industrialized countries (Bowen, 2015; Widom et al., 2014; McFarlane et al., 2014). It also reinforces the seriousness of the IPV problem for women from poor communities, and the risk for children who have fewer resources to understand and address it (Olaya, Tarragona, de la Osa, & Ezpeleta, 2008). Early childhood exposure to a violent and poverty-stricken family environment predisposes the child to having mental and physical health problems. Women experiencing IPV may lack emotional availability and the ability to provide safety, support, protection and basic care for their children. Following the experience of IPV mothers may demonstrate Posttraumatic Stress Disorder (PTSD), and maternal PTSD symptoms have been postulated to mediate the relationship between mothers' IPV experiences and children's internalizing and externalizing symptoms (Greene, Chan, McCarthy, Wakschlag, & Briggs-Gowan, 2018). Children living in violent homes learn that violence is socially acceptable, and often receive punitive parenting styles (Silva et al., 2017), and, consequently, repeat violent behavior with their peers at school (Baldry, 2003) and in their intimate relationships in the future (Temple, Shorey, Tortolero, Wolfe, Stuart, 2013), thus consolidating the intergenerational transmission of violence (Widom et al, 2014; Kimber, Adham, Gill, McTavish, MacMillan, 2018).

The young age of first exposure to IPV, and the associations with subsequent mental health, reinforces the importance of the first 1000 days in determining an individual's subsequent

trajectory (National Scientific Council on the Developing Child, 2012; Lewis, Galbally, Gannon, & Symeonides, 2014). The particular vulnerability of children in this period of life to exposure to IPV shown in this study is consistent with emerging awareness (Bucci, Marques, Oh, & Harris, 2016; Shonkoff et al., 2012) at this age of social relationships in the family, and increasing sensitivity to maternal distress. A child's exposure to IPV at this age will impact on the development of emotional regulation, which will manifest as externalizing behavior and emotional symptoms at school age (Levendosky et al., 2016).

The most frequently reported types of postnatal IPV exposure in the literature (Edleson, Shin, & Armendariz, 2008) are "eyewitness" and "overhears", perhaps because they are easier to report. The high 'see' and 'hear' percentages found in this study are lower than those found by Edleson et al. (2008), but are much greater than those found by Fusco and Fantuzzo (2009). These differences may be due to diverse methodologies related to sample size, age of children, and measures used. The young child's sensitivity to his mothers' mental state is illustrated by the most frequently reported child exposure being "experiences the aftermath". If a child decides to intervene to defend the mother, they can intentionally or accidentally become the victim themselves. Previous research (Ericksen & Henderson, 1992) found that 30% of the children intervened in favor of the mother, while in this study the percentage was 12%. Another study (Edleson et al. (2008), found that 41.5% of the children shouted from where they were to stop the violence, 23% shouted in the same environment, 41.5% tried to physically stop the violence and 47.7% called someone to help. The way a child intervenes in the violence to which they are exposed will vary and is probably related to the impact of exposure, as well as showing that children are not passive in situations of violence.

4.1. Strengths and limitations

The study has several strengths. First, it is a population-based cohort study that has been longitudinally following the same women from a poor urban community since 2005. Three separate assessments were made of experience of IPV: during pregnancy, in the first post-natal year and six to nine years after delivery. In this third stage, besides the evaluation of the same women, the children who were the result of the initial pregnancies were included. Second, it collected multi-informant (mothers' and teachers') evaluations of the children's mental health, using an instrument validated in Brazil, although the different informants produced different results. Third, the theoretical classification of Holden (2003), which includes ten types of exposure, was used to identify the children's exposure to IPV, allowing a wider assessment encompassing several direct and indirect, active and passive aspects of experiencing violent events. Fourth, it was possible to identify different risks to the child related to different ages of onset of exposure, which is an important contribution to the understanding of age-related risk trajectories and informs the development of age-specific strategies. Finally, it has been carried out in an urban area with precarious socioeconomic and health indicators, which characterize it as a priority area for public policies, and the findings will be applicable to many other urban populations in LMIC settings around the world living in similar conditions.

The main limitation of the study, as with all prospective cohorts, was the loss to follow-up, and although the differences between women found and those lost were not statistically significant, this loss probably resulted in an under-estimate of the impact of IPV. In the initial stages of this cohort study, both prenatal and postpartum appointments and frequent visits to local health centers facilitated contact with the interviewers. After six to nine years, many women had changed their address and many others were working all week and did not want to be interviewed at the weekend. Secondly, information on IPV was self-reported by women, which probably underestimated the frequency of violence. IPV is a sensitive issue that women may feel embarrassed to report, or feel afraid of the consequences in doing so. This also applies

to the child's exposure to IPV, as only the mother reported it, the child was not interviewed, and no information was collected from other possible caregivers (such as relatives). Thirdly, without interviewing the child, the researchers were not able to ask the child about direct experience of physical abuse or neglect which could have had an important influence on the outcome.

4.2 Conclusions and recommendations

In conclusion, exposure to IPV is common in pregnancy (Han & Stewart, 2014) and in early childhood in poor urban communities (Olaya et al., 2008). Young children are particularly vulnerable and are sensitive to the age of first exposure and to the types and frequency of exposure, resulting in mental health difficulties at school age.

Further research is needed to understand the complex interaction of types of exposure, risk factors and protective factors on the impact of exposure to IPV on the physical and psychosocial health of children and adolescents. Longitudinal surveys that accompany the same population at different stages of development are required to investigate the impact of these adverse experiences in childhood on adult life.

Recommendations from this study include : a) pregnant women should be encouraged to report IPV and offered support and protection; b) professionals working with pregnant women and families with young children need training in identifying signs of IPV and in asking sensitive questions to encourage mothers to report what is happening at home; c) campaigns to reduce IPV should be undertaken with adolescents in school; and d) interventions are required to reduce the negative impacts of IPV exposure on the physical and mental health of women and children. Both preventative and treatment interventions should be targeted on vulnerable women from poor urban communities and in the first two years of their child's life, to interrupt

the cycle of violence and prevent future generations of children from being exposed to traumatic and damaging adverse childhood experiences.

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References

- Baldry, A. C. (2003). Bullying in schools and exposure to domestic violence. *Child Abuse & Neglect*, 27, 713–732. doi:10.1016/S0145-2134(03)00114-5
- Boman, F., Stafström, M., Lundin, N., Moghadassi, M., Törnhage, C. J., & Östergren, P. O. (2016). Comparing parent and teacher assessments of mental health in elementary school children. *Scandinavian Journal of Public Health*, 44, 168–176. doi:10.1177/1403494815610929
- Bowen, E. (2015). The impact of intimate partner violence on preschool children's peer problems: An analysis of risk and protective factors. *Child Abuse & Neglect*, 50, 141-150. doi:org/10.1016/j.chiabu.2015.09.005
- Bucci, M., Marques, S. S., Oh, D., Harris, N. B. (2016). Toxic Stress in Children and Adolescents. *Advances in Pediatrics*, 63, 403-428. doi:10.1016/j.yapd.2016.04.002
- Capaldi, D. M., Knoble, N. B., Shortt, J. W., Kim, H. K. (2012). A Systematic Review of Risk Factors for Intimate Partner Violence. *Partner Abuse*, 3(2): 231–280. doi:10.1891/1946-6560.3.2.231.
- Edleson, J. L., Shin, N., Armendariz, K. K. J. (2008). Measuring children's exposure to domestic violence: The development and testing of the Child Exposure to Domestic Violence (CEDV) Scale. *Children and Youth Services Review*, 30, 502-521. doi:10.1016/j.childyouth.2007.11.006
- Ericksen, J. R., & Henderson, A. D. (1992). Witnessing family violence: The children's experience. *Journal of Advanced Nursing*, 17, 1200-1209. doi:10.1111/j.1365-2648.1992.tb01836.x
- Fleming, P. J., McCleary-Sills, J., Morton, M., Levto, R., Heilman, B., Barker, G. (2015). Risk factors for men's lifetime perpetration of physical violence against intimate partners:

- Results from the International Men and Gender Equality Survey (IMAGES) in eight countries. *Public Library of Science*, 10(3): e0118639. doi:10.1371/journal.pone.0118639.
- Fusco, R. A., & Fantuzzo, J. W. (2009). Domestic violence crimes and children: A population-based investigation of direct sensory exposure and the nature of involvement. *Children and Youth Services Review*, 31, 249-256. doi:10.1016/j.childyouth.2008.07.017
- Goodman, R. (1997). The Strengths and Difficulties Questionnaire: a research note. *Journal of Child Psychology and Psychiatry*, 38, 581-586
- Greene, C. A., Chan, G., McCarthy, K. J., Wakschlag, L. S., Briggs-Gowan, M. J. (2018). Psychological and physical intimate partner violence and young children's mental health: The role of maternal posttraumatic stress symptoms and parenting behaviors. *Child Abuse & Neglect*, 77:168-179. doi.org/10.1016/j.chiabu.2018.01.012
- Halfon, N., Larson, K., Lu, M., Tullis, E., Russ, S. (2014). Lifecourse Health Development: Past, Present and Future. *Maternal and Child Health Journal*, 18: 344–365. doi 10.1007/s10995-013-1346-2
- Han, A., Stewart, D. E. (2014). Maternal and fetal outcomes of intimate partner violence associated with pregnancy in the Latin American and Caribbean region. *International Journal of Gynecology and Obstetrics*, 124(1):6-11. doi: 10.1016/j.ijgo.2013.06.037
- Holden, G. W. (2003). Children exposed to domestic violence and child abuse: terminology and taxonomy. *Clinical Child and Family Psychology Review*, 6, 151-160. doi:10.1023/A:1024906315255
- Howell, K. H., Barnes, S. E., Miller, L. E., & Graham-Bermann, S. A. (2016). Developmental variations in the impact of intimate partner violence exposure during childhood. *Journal of Injury and Violence Research*, 8, 43-57. doi: 10.5249/ jivr.v8i1.663
- Jimenez, M. E., Wade, R., Lin, Y., Morrow, L. M., & Reichman, N. E. (2016). Adverse

- Experiences in Early Childhood and Kindergarten Outcomes. *Pediatrics*, 137, e20151839.
doi:10.1542/peds.2015-1839
- Johnson, S., Hollis, C., Marlow, N., Simms, V., & Wolke, D. (2014). Screening for childhood mental health disorders using the Strengths and Difficulties Questionnaire: the validity of multi-informant reports. *Developmental Medicine & Child Neurology*, 56, 453–459.
doi:10.1111/dmcn.12360
- Kimber, M., Adham, S., Gill, S., McTavish, J., MacMillan, H. L. (2018). The association between child exposure to intimate partner violence (IPV) and perpetration of IPV in adulthood: A systematic review. *Child Abuse & Neglect*, 76: 273-286.
doi.org/10.1016/j.chiabu.2017.11.007
- Levendosky, A. A., Bogat, G. A., Lonstein, J. S., Martinez-Torteya, C., Muzik, M., Granger, D. A., & von Eye, A. (2016). Infant adrenocortical reactivity and behavioral functioning: relation to early exposure to maternal intimate partner violence. *Stress*, 19, 37–44. doi:10.3109/10253890.2015.1108303
- Lewis, A. J., Galbally, M., Gannon, T., Symeonides, C. (2014). Early life programming as a target for prevention of child and adolescent mental disorders. *BMC Medicine*, 12:33.
doi:10.1186/1741-7015-12-33
- McFarlane, J., Symes, L., Binder, B. K., Maddoux, J., & Paulson, R. (2014). Maternal-Child Dyads of Functioning: the Intergenerational Impact of Violence Against Women on Children. *Maternal and Child Health Journal*, 18, 2236–2243. doi:10.1007/s10995-014-1473-4
- National Scientific Council on the Developing Child. (2012). Establishing a Level Foundation for Life: Mental Health Begins in Early Childhood: Working Paper 6.
Available: <<http://www.developingchild.harvard.edu>>. Accessed: 20/01/2016.
- Olaya Guzmán, B., Tarragona, M., de la Osa, N., Ezpeleta, L. (2008). Protocolo de

- evaluación de niños y adolescentes víctimas de la violencia doméstica. *Papeles del Psicólogo*, 29, 123-135. Available: <http://www.redalyc.org/articulo.oa?id=77829113>. Accessed: 27/02/2016.
- Ribeiro, M. R. C., Alves, M. T. S. S. B., Batista, R. F. L., Ribeiro, C. C. C., Schraiber, L. B., Barbieri, M. A., ... Silva, A. A. M. (2014). Confirmatory Factor Analysis of the WHO Violence against Women Instrument in Pregnant Women: Results from the BRISA Prenatal Cohort. *PLoS ONE*, 9, e115382. doi:10.1371/journal.pone.0115382
- Schraiber, L. B., Latorre, M. R. D. O., França Jr, I., Segri, N. J., & D'Oliveira, A. F. P. L. (2010). Validity of the WHO VAW study instrument for estimating gender based violence against women. *Revista de Saúde Pública*, 44, 658-666. doi:10.1590/S0034-89102010000400009
- Shonkoff, J. P., Garner, A. S., The Committee on Psychosocial Aspects of Child and Family Health, Committee on Early Childhood, Adoption, and Dependent Care, Section on Developmental and Behavioral Pediatrics. (2012). The Lifelong Effects of Early Childhood Adversity and Toxic Stress. *Pediatrics*, 129, e232-e246. doi:10.1542/peds.2011-2663
- Silva, E. P., Lemos, A., Andrade, C. H. S., & Ludermir, A. B. (2018). Intimate partner violence during pregnancy and behavioral problems in children and adolescents: a meta-analysis. *Jornal de Pediatria*, Available: <https://www.sciencedirect.com/journal/jornal-de-pediatria/articles-in-press>. Accessed: 21/03/2018. doi:10.1016/j.jpeds.2018.01.007
- Silva, J. M. M., Lima, M. C., Ludermir, A. B. (2017). Intimate partner violence and maternal educational practice. *Revista de Saúde Pública*, 51:34. doi:10.1590/S1518-8787.2017051006848
- Temple, J. R., Shorey, R. C., Tortolero, S. R., Wolfe, D. A., Stuart, G. L. (2013). Importance of Gender and Attitudes about Violence in the Relationship between Exposure to

Interparental Violence and the Perpetration of Teen Dating Violence. *Child Abuse & Neglect*, 37(5): 343–352. doi:10.1016/j.chiabu.2013.02.001.

Widom, C. S, Czaja, S., Dutton, M. A. (2014). Child abuse and neglect and intimate partner violence victimization and perpetration: A prospective investigation. *Child Abuse & Neglect*, 38(4): 650–663. doi.org/10.1016/j.chiabu.2013.11.004

Table 1
Behavioral difficulties at school age reported by mothers and teachers using the SDQ

	SDQ reported by mothers (N=614)					SDQ reported by teachers (N=614)				
	Exposed to IPV		Not exposed to IPV		p	Exposed to IPV		Not exposed to IPV		p
	n	%	n	%		n	%	n	%	
Total Difficulties score	137	71.7	54	28.3	< .0001	70	59.8	47	40.2	.85
Hyperactivity/inattention	124	67.8	59	32.2	.018	53	61.6	33	38.4	.83
Emotional symptoms	130	75.6	42	24.4	< .0001	32	55.2	26	44.8	.37
Conduct problems	174	69.6	76	30.4	< .0001	71	60.7	46	39.3	.98
Peer relationship problems	88	67.2	43	32.8	.08	44	67.7	21	32.3	.21
Pro-social difficulties	24	59.7	7	40.3	.049	33	61.0	25	39.0	.54

Table 2
Characteristics of the family and child behavioral difficulties at school age reported by mothers

Variables	N=614 n (%)	Child Behavioral Difficulties Score			
		Normal	Abnormal	OR (IC 95%)	p
		n (%)	n (%)		
Woman's sociodemographic characteristics					
Age (years)					
≥ 30	456 (74.3)	325 (76.8)	131 (68.6)	1.0	.03
< 30	158 (25.7)	98 (23.2)	60 (31.4)	1.5 (1.0-2.2)	
Race /Skin color					
White	113 (18.4)	90 (21.3)	23 (12.0)		.007
Non-white	501 (81.6)	333 (78.7)	168 (88.0)	2.0 (1.2-3.2)	
Education (years of schooling)					
> 9	304 (49.5)	240 (56.8)	64 (33.5)	1.0	< .0001
≤ 9	310 (50.5)	183 (43.2)	127 (66.5)	2.6 (1.8-3.7)	
Marital status					
With partner	498 (81.1)	349 (82.5)	149 (78.0)	1.0	.19
Without partner	116 (18.9)	74 (17.5)	42 (22.0)	1.3 (.8-2.0)	
Current partner (Child's father)					
Yes	392 (63.8)	274 (64.8)	118 (61.8)	1.0	.475
No	222 (36.2)	149 (35.2)	73 (38.2)	1.1 (.8-1.6)	
Employment status					
Employment	320 (52.1)	237 (56.0)	83 (43.5)	1.0	.004
Unemployment	294 (47.9)	186 (44.0)	108 (56.5)	1.7 (1.2-2.3)	
Income (minimum wage)					
≥ 1	205 (33.4)	157 (37.1)	48 (21.1)	1.0	.004
Without income / <1	409 (66.6)	266 (62.9)	143 (74.9)	1.8 (1.2-2.6)	
House ownership					
Yes	424 (69.1)	302 (71.4)	122 (63.9)	1.0	.06
No	190 (30.9)	121 (28.6)	69 (36.1)	1.4 (.98-2.0)	
Woman's head of household					
No	436 (71.0)	310 (73.3)	126 (66.0)	1.0	.06
Yes	178 (29.0)	113 (26.7)	65 (34.0)	1.4 (.97-2.0)	

Behavioral characteristics of the woman					
Smoke					
No	471 (76.7)	332 (78.5)	139 (72.8)	1.0	
Yes	143 (23.3)	91 (21.5)	52 (27.2)	1.4 (.9-2.0)	.12
Use of alcohol					
No	271 (44.1)	1959 (46.1)	76 (39.8)	1.0	
Yes	343 (55.9)	228 (53.9)	115 (60.2)	1.3 (.9-1.8)	.145
Drug use					
No	584 (95.1)	401 (94.8)	183 (95.8)	1.0	
Yes	30 (4.9)	22 (5.2)	8 (4.2)	.8 (.3-1.8)	.59
Behavioral characteristics of the partner					
Smoke					
No	426 (69.4)	301 (71.2)	125 (65.4)	1.0	
Yes	188 (30.6)	122 (28.4)	66 (34.5)	1.3 (.9-1.9)	.16
Abusive use of alcohol (drunkenness)					
No	255 (41.5)	180 (42.5)	75 (39.3)	1.0	
Yes	359 (58.5)	243 (57.4)	116 (60.7)	1.1 (.8-1.6)	.44
Drug use					
No	550 (89.6)	394 (93.1)	156 (81.7)	1.0	
Yes	64 (10.4)	29 (6.9)	35 (18.3)	3.0 (1.8-5.3)	< .0001
Involvement in fights outside the home					
No	555 (90.4)	390 (92.2)	165 (86.4)	1.0	
Yes	59 (9.6)	33 (7.8)	26 (13.6)	1.9 (1.1-3.2)	.025

*Characteristics of the family and child behavioral difficulties at school age reported by mothers
(continuation)*

Variables	N=614 n (%)	Child Behavioral Difficulties Score			
		Normal	Abnormal	OR (IC 95%)	p
		n (%)	n (%)		
Profile of the couple's relationship					
Duration of the couple's relationship					
< 6 years	208 (33.9)	141(33.3)	67 (35.0)	1.0	
≥ 6 years	406 (66.1)	282 (66.7)	124 (65.0)	.9 (.6-1.3)	.67
Communication with partner					
Good	493 (80.3)	348 (82.3)	145 (75.9)	1.0	
Poor	121 (19.7)	75 (17.7)	46 (24.1)	1.5 (.97-2.2)	.068
Fights (times per month)					
< 1	417 (67.9)	304 (71.9)	113 (59.2)	1.0	
≥ 1	197 (32.1)	119 (28.1)	78 (40.8)	1.8 (1.2-2.5)	.002
Women's Infidelity					
No	586 (95.4)	408 (96.4)	178 (93.2)	1.0	
Yes	28 (4.6)	15 (3.5)	13 (6.8)	1.98 (.9-4.3)	.078
Physical aggression against the partner without being attacked					
No	532 (86.6)	368 (87.0)	164 (85.9)	1.0	
Yes	82 (13.4)	55 (13.0)	27 (14.1)	1.1 (.7-1.8)	.70
Partner infidelity*					
No	385 (64.6)	272 (66.3)	113 (60.7)	1.0	
Yes	211 (35.4)	138 (33.7)	73 (39.2)	1.3 (.9-1.8)	.187
Socio-demographic characteristics of the child					
Age (years)					
6 – 7	300 (48.9)	202 (47.7)	98 (51.3)	1.0	
8 – 9	314 (51.1)	221 (52.2)	93 (48.7)	1.0 (.8-1.6)	.415
Sex					
Female	312 (50.8)	216 (51.1)	96 (50.3)	1.0	
Male	302 (49.0)	206 (48.7)	95 (49.0)	1.1 (.7-1.5)	.854
Siblings					
No	127 (20.7)	97 (27.9)	30 (15.7)	1.0	
Yes	487 (79.3)	326 (77.0)	161 (84.3)	1.6 (1.1-2.5)	.04

Number of siblings					
None	127 (20.7)	97 (27.9)	30 (15.7)	1.0	
01-02	261 (42.5)	100 (42.5)	81 (42.4)	1.5 (.9-2.4)	.07
03 or more	226 (36.8)	146 (34.5)	80 (41.9)	1.8 (1.1-2.9)	
Position in the family					
1st or 2nd born	537 (87.5)	382 (90.3)	155 (81.1)	1.0	
≥ Third born	77 (12.5)	41 (9.7)	36 (18.8)	2.1 (1.3-3.5)	.002
Education					
Secondary school	488 (79.5)	342 (80.9)	146 (76.4)	1.0	
Primary school	126 (20.5)	81 (19.1)	45 (23.6)	1.3 (.8-1.9)	.21
Type of school					
Private	289 (47.1)	220 (52.0)	69 (36.1)	1.0	
Public	325 (52.9)	203 (48.0)	122 (63.9)	1.9 (1.3-2.7)	< .0001

Table 3
Types of child's exposure to IPV and behavioral difficulties at school age reported by mothers

Type of exposure to IPV	N=614		Child Behavioral Difficulties Score						
			Normal		Abnormal		Unadjusted OR (95% CI)	p	Adjusted OR (95% CI)
	n	%	n	%	n	%			
DIRECT EXPOSURE									
^a Prenatal exposure									
No	443	72.0	315	74.5	128	67.0	1.00		1.00
Yes	171	28.0	108	25.5	63	33.0	1.44 (.99-2.1)	.057	1.13 (.76-1.67)
^b Overheard									
No	413	67.3	304	71.9	109	57.0	1.00		1.00
Yes	201	32.7	119	28.1	82	43.0	1.92 (1.35-2.74)	< .0001	1.56 (1.08-2.30)
^c Witnessed									
No	443	72.1	324	76.6	119	62.3	1.00		1.00
Yes	171	27.9	99	23.4	72	37.7	1.98 (1.37-2.86)	< .0001	1.63 (1.10-2.42)
^d Intervened									
No	540	88.0	378	89.4	162	84.8	1.00		1.00
Yes	74	12.0	45	10.6	29	15.2	1.50 (.9-2.48)	.111	1.01 (.58-1.75)
^e Participate									
No	605	98.5	421	99.5	184	96.3	1.00		1.00
Yes	9	1.5	2	0.5	7	3.7	8.00 (1.64-38.91)	.01	5.23 (1.00-27.21)
^f Victim									
No	550	89.6	391	92.4	159	83.3	1.00		1.00
Yes	64	10.4	32	7.6	32	16.7	2.50 (1.50-4.15)	.001	2.03 (1.18-3.50)
INDIRECT EXPOSURE									
^a Observed the initial effects									
No	494	80.5	355	83.9	139	72.8	1.00		1.00
Yes	120	19.5	68	16.1	52	27.2	1.95 (1.29-2.95)	.001	1.63 (1.06-2.52)
^b Experiences the aftermath									
No	411	66.9	294	69.5	117	61.3	1.00		1.00
Yes	203	33.1	129	30.5	74	38.7	1.44 (1.00-2.06)	.045	1.28 (.88-1.87)

ⁱ Hears about it									
No	551	89.7	394	93.1	157	82.2	1.00		1.00
Yes	63	10.3	29	6.9	34	17.8	2.94 (1.73-4.99)	<.0001	2.31 (1.32-4.03)
^j Ostensibly unaware									
No	518	84.4	373	88.2	145	75.9	1.00		1.00
Yes	96	15.6	50	11.8	46	24.1	2.37 (1.51-3.69)	<.0001	2.03 (1.28-3.22)

^aAdjusted for variables of the **mother**: age, education, marital status, head of household, smoke and use of alcohol; **of the partner**: smoke, drug fights outside the home; **profile of the couple's relationship**: communication with partner, fights, woman's infidelity; **of the child**: having siblings, number of siblings and type of school.

^{b,c}Adjusted for variables of the **mother**: age, race/skin color, education, smoke and use of alcohol; **of the partner**: smoke, drugs, fights outside the home; **profile of the couple's relationship**: communication with partner, fights, woman's infidelity; **of the child**: having siblings, number of and type of school

^dAdjusted for variables of the **mother**: age, smoke and use of alcohol; **of the partner**: smoke, drugs, fights outside the home; **profile of the couple's relationship**: fights, woman's infidelity.

^eAdjusted for variables of the **mother**: smoke; **of the partner**: drugs and fights outside the home; **profile of the couple's relationship**: communication with partner, fights; **of the child**: sex, position in the family and type of school

^fAdjusted for variables of the **mother**: age, marital status, smoke and use of alcohol; **of the partner**: smoke, drugs and fights outside the home; **of the couple's relationship**: fights, infidelity of the woman; **of the child**: sex

^gAdjusted for variables of the **mother**: age, education, smoke and use of alcohol; **of the partner**: smoke, drugs and fights outside the home; **profile of the couple's relationship**: fights, woman's infidelity; **of the child**: number of siblings, position in the family and type of school

^hAdjusted for variables of the **mother**: age, race/skin color, marital status, employment status, income, head of household, smoke and use of alcohol; **of the partner**: drugs and fights outside the home; **profile of the couple's relationship**: fights, woman's infidelity; **of the child**: type of school

ⁱAdjusted for variables of the **mother**: age, education, situação conjugal, smoke and use of alcohol; **of the partner**: smoke, drugs, and fights outside the home; **profile of the couple's relationship**: communication with partner, fights, woman's infidelity; **of the child**: sex, siblings, number of siblings, position in the family and type of school

^jAdjusted for variables of the **mother**: age, education, house ownership, head of household, smoke and use of alcohol; **of the partner**: smoke, drugs and fights outside the home; **profile of the couple's relationship**: fights, woman's infidelity; **of the child**: sex, siblings, number of siblings, position in the family and type of school

Table 4

Associations between age of first exposure to IPV and child behavioral difficulties at school age reported by mothers

Exposure to IPV	N=614 n (%)	Normal n (%)	Abnormal n (%)	Unadjusted OR (95% CI)	Adjusted OR^a (95%CI)
None	242 (39.4)	188 (44.4)	54 (28.2)	1.0	1.0
Prenatal	171 (28.0)	108 (25.5)	63 (33.0)	2.0 (1.3-3.1)	1.7 (1.1-2.6)
0 – 11 months	44 (7.1)	25 (5.9)	19 (10.0)	2.6 (1.4-5.2)	2.2 (1.1-4.4)
1 – 2 years	48 (7.8)	27 (6.4)	21 (11.0)	2.7 (1.4-5.2)	2.5 (1.3-4.8)
3 – 6 years	109 (17.7)	75 (17.7)	34 (17.8)	1.6 (0.9-2.6)	1.4 (0.8-2.4)
p				.001	< .0001

^aAdjusted for variables of the **mother**: age, education, marital status, head of household, smoke and use of alcohol; **of the partner**: smoke, drugs, drunkenness, fights outside the home; **profile of the couple's relationship**: communication with partner, fights, women physical aggression against the partner, woman's infidelity; **of the child**: having siblings, number of siblings, position of the family and type of the school

Figure 1 Flow chart of participants

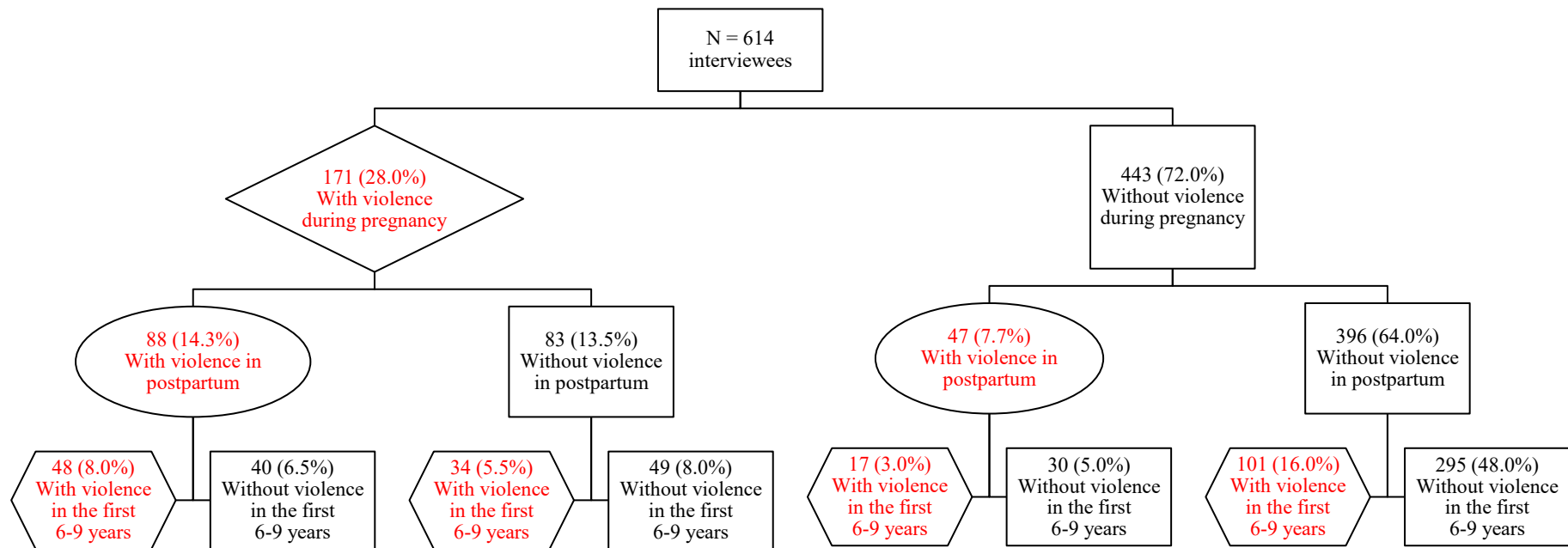


Figure 2 Types of IPV reported by mothers in pregnancy, the postpartum period, and in the first 7 years of the child's life

